

EEPttestimony

Bill No. 466

Support Y N

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From: Mary Woollen [woollen@hawaii.edu]
Sent: Monday, March 23, 2009 4:50 PM
To: EEPtestimony
Subject: SB 466, SD2: Relating to Pollution, Leaf Blowers

Chair Morita, Vice Chair Coffman, and Members of the Committee **Cat AF AS AX B C**

I support the intent of SB 466 SD2 and appreciate very much that you have taken the initiative to address this very important issue. However, while the bill has included ramifications for potential violators, I have some specific comments and suggested amendments in the following sections:

On page 1, Section 1 (a) lines 1-6: I feel these hours are too 'lax' for densely populated areas. Many residents leave home before 7:00 a.m. and arrive home at or after 7:00 p.m., after working long hours in often stressful employment – and should be able to enjoy peace and quiet in their homes and neighborhood on returning to their residences. If we must be subjected to leaf blowers, then condominium managers should be able to schedule leaf blowing operations within a two hour block period in the middle of the day. Furthermore, lines 6 and 7 allow leaf blowing on Sundays and federal holidays. Surely we deserve at least one day of peace and rest from this kind of noise.

On page 1, Section 1 (a) (1) lines 1 through 3: The average blower measures 70-75 dB at 50 feet according to the EPA (EPA, Noise: A Health Problem, United States Environmental Protection Agency, Office of Noise Abatement and Control, August, 1978). I suggest the distance of ten feet be expanded to no more than 50 feet. A lot more than noise is blowing into our units. For example, we are subjected to dust containing rodent droppings (yes); harmful CO2, CO or carbon monoxide; NOx or nitrogen oxides, and hydrocarbons, HC from the motors. In addition, fine PM2.5 particles, which are man-made are occurring: these do not occur in nature, they evade the body's defense systems – and increase the number and severity of asthma attacks, cause or aggravate bronchitis or other lung disease and reduce our ability to fight infections (Air Resources Board, Status Report: 1995-1996). We are receiving bacteria and street dust, including lead and arsenic. And all of this is coming from distances exceeding ten feet. If you were to visit Pualei Circle, you would find intolerable noise, dust, other debris and toxic fumes from distances of more than 50 feet.

On page 1, Section 1 (3), lines 1 and 2: We have had two and three leaf blowers operating simultaneously in the parking area and at the swimming pool area. The sound of three of these operating expands exponentially. This harms the residents and the user. Deafness is a social problem because it causes isolation. But in the case of Hawaii, it is also a civil rights issue because the individuals taking these low-paying jobs are most often those with the least education and the least ability to confront their employer should they have concerns. They are likely to be immigrants with limited English written or spoken abilities and lack the ability to read English language newspapers (the most common source of notice of harmful impacts or legislative initiatives).

On page 1, (4), line 1: The maximum decibel level of 70 dB is much too high. A blower measuring 70-75 dB at 50 feet can reach 90-100 dB at the operator's ear (WHO, 1980). While manufacturers claim that the average blower measures 70-75 dB at 50 feet, and claim this is the same noise level of a vacuum cleaner, how many of us would allow an uninvited vacuum cleaner into our homes for several hours per day? Also, the World Health Organization recommends general daytime outdoor levels of 55dBA or less but 45dBA to meet sleep criteria (World Health Organization, 1980, Environmental Health Criteria 12: Noise). Thus, even a 65 decibel leaf blower would be 100 times too loud to allow healthful sleep (which often takes place during daytime hours for

night workers and others). According to the WHO, noise can impair sleep even when the sleeper is not awakened. Our complex includes elderly and infants who sleep during the day time hours. My condo floor alone has six units – half of these are airline employees who work evening shifts or fly all night.

Regarding 342H, page 2: Leaf blower debris. (a). The California ARB has conducted tests showing that a leaf blower creates 2.6 pounds of PM10 dust emissions per hour of use (California ARB, 1991). This dust contains all of the harmful substances listed above. Who is going to enforce or monitor this section when the trade winds blow every afternoon?

Our concern for the health and welfare of our citizens, including those who cannot speak for themselves, should be paramount in all that we do. We do not need to recreate the wheel. Other states and cities have already done this for us. Studies and comparisons have included grandmothers sweeping and raking alongside leaf blowers – and proving in every instance that they were faster – and according to expert witnesses, did a better job – at less cost.

I am for a total ban of leaf blowers and support using rakes and brooms to clean leaves and debris from sidewalks.

Thank you,
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LEAF BLOWER FACTS

LATE TESTIMONY

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Leaf Blower Noise and Its Consequences

Noise interferes with communication, sleep, and work. The U.S. EPA says noise degrades quality of life by impairing communication and social interaction; reducing the accuracy of work, particularly complex tasks; and creating stressful levels of frustration and aggravation that last even when the noise has ceased (1).

Sacramento's city code states "Every person in the city is entitled to live in an environment free from excessive, unnecessary or offensive noise levels." Our General Plan states that the normally acceptable ambient noise level in residential areas is no more than 60 dB; 60-70 is conditionally acceptable; and higher levels are normally unacceptable. The decibel scale is logarithmic--each increase of 10, say 60 to 70, represents a noise 10 times louder.

The average blower measures 70-75 dB at 50 feet according to a manufacturer's lobbyist (2), thus louder at any closer distance. Leaf blowers are routinely used less than 50 feet from unconsenting pedestrians and neighboring homes that may be occupied by home workers, retirees, day sleepers, children, the ill or disabled, and pets.

The World Health Organization recommends general daytime outdoor noise levels of

55 dBA* or less, but 45 dBA to meet sleep criteria (3). Thus, even a 65-decibel leaf blower would be 100 times too loud** to allow healthful sleep (which often takes place during daytime hours for night workers and others). Noise can impair sleep even when the sleeper is not awakened.

Don't be fooled by comparison of 65 decibels from a leaf blower to the volume of a normal conversation. You wouldn't want a noise in your home as loud as a normal conversation that you had not invited and could not control. In any case, no backpack blower on the market meets the 65 dB standard. Echo claims to (for one of their seven available models) but Consumer Reports says that's not true (4).

Acoustics experts say blower noise is especially irritating because of its particular pitch, the changing amplitude, and the lack of control by the hearer (5).

Blower noise can impair gardeners' hearing. A blower measuring 70-75 dB at 50 feet can reach 90-100 dB at the operator's ear. OSHA requires hearing protection for noise over 85, and according to the World Health Organization, "there is an increasing predictable risk" of hearing damage from noise above 75 dBA. Use of certain antibiotics can create vulnerability at lower noise levels. Anecdotally we have examples of hearing loss in gardeners. Sacramento Bee writer Edie Lau quotes one local gardener: "Eventually it's going to hurt everyone who uses it...I'm already a little bit deaf..." Deafness is a serious problem because it causes social isolation by impairing communication. Deafness caused by noise is irreversible. According to the American Academy of Otolaryngology, half the wearers of hearing protectors do not get the expected benefit, due to improper fit or failure to wear them continuously (6).

Blower noise endangers gardeners in other ways as well. According to Dr. Alice Suter, in a 1994 report to the OSHA Standards Planning Committee, there is recent evidence "that high levels of noise and the resulting hearing losses contribute to industrial accidents" and "hearing protection devices...may actually impair work safety under certain conditions...In addition, there is growing evidence that noise adversely affects general health, and the cardiovascular system in particular." (7)

As Kenneth Maue writes in the Autumn 1997 Right to Quiet newsletter: "When harsh noise hits, instead of reaching out to greet the world with open ears, we shrink back into shells, or try to; in truth the ears can't shut, nor like the eyes turn away. Noise controls space like an occupying army, travels through walls, enters homes, molests bodies, violates privacy, stops thought, batters each of us into isolation." (8) Noise causes loss of community and is both a sign and a cause of aggression and violence.

* the A-weighting (expressed as dBA) is one way of evaluating high and low frequencies to approximate the ear's response

** from 45 to 65 is two ten-fold increases, or 10×10

References:

1. Excerpt from Noise: A Health Problem, United States Environmental Protection Agency, Office of Noise Abatement and Control, August 1978. This can be obtained from the web site of the Noise Pollution Clearinghouse at

www.nonoise.org.

2. Sacramento Bee, November 10, 1997, "Whining leaf blowers leave ears aching for quiet".
3. Environmental Health Criteria 12: Noise, World Health Organization, 1980.
4. Consumer Reports, April 1997, page 8. The magazine reports Echo's new blower measured 69.5 dBA at 50 feet, and says "In field tests, the PB46LN didn't meet its noise claims...When measured at the operator's ear, the noise was at least 90 dBA for most backpack models in our September 1995 report. The Echo PB46LN was no better." A followup article in the August 1997 issue that begins "We have a very low tolerance for companies that make false claims to consumers about their products, and an equally low tolerance for companies that make false statements about our test procedures..." reports that Echo has publicly questioned Consumers Union's integrity, and that CU has demanded a retraction.
5. For the Sacramento Bee article listed at Note 2, reporter Edie Lau interviewed Michael H. L. Hecker, a Los Altos psychoacoustician; Mitchell Sutter, a UCD auditory neuroscientist; and Harvey Wichman, a Claremont psychology professor.
6. "Noise, Ears, and Hearing Protection", a public service brochure of the American Academy of Otolaryngology - Head and Neck Surgery. The warning about the limits of hearing protection are echoed by Dr. Alice Suter (see Note 7), who says: "hearing protectors, as they are worn in the field, provide only a fraction of the attenuation that their 'noise reduction ratings' (NRRS) imply." Dr. Suter also quotes a federally-sponsored consensus conference: "It is extremely foolhardy to regard hearing protection as a preferred way to limit noise exposures..."
7. "Comments on Occupational Noise to the OSHA Standards Planning Committee" by Alice Suter, Ph.D., can also be found on the NPC web site (in the [NPC library](#)).
8. Right to Quiet Society for Soundscape Awareness and Protection, #359, 1985 Wallace Street, Vancouver BC Canada V6R 4H4. Telephone 604 222-0207. www.islandnet.com/~skookum/quiet/

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Air Pollution From Leaf Blowers

The California Air Resources Board (ARB) says air pollution costs our state billions of dollars annually in health care and crop and building damage. It irritates eyes and throats, harms lungs, and causes cancer and premature death (1), including sudden death from heart attacks. Ozone*, a gas, is Sacramento's worst air pollution problem (2), and we also have unhealthy levels of liquid and solid particulate matter (PM**) (3). Blowers, especially gasoline-powered, contribute to both of these. Emissions from the two-stroke combustion engine include PM as well as gaseous carbon monoxide, nitrogen oxides, and hydrocarbons (CO, NOx, and HC). Leaf blowers also raise (entrain) dust from the ground. And evaporative emissions of fuel occur during the refueling process, which sometimes spills gas on the operators, and from the fuel tank. Comparisons that exclude some of these could understate the problem.

Fine PM2.5 particles, which are man-made and do not occur in nature, evade the body's defense systems. According to the EPA and ARB they can increase the number and severity of asthma attacks, cause or aggravate bronchitis or other lung disease, and reduce our ability to fight infections (4).

Leaf blower motors are inordinately large emitters of CO, NOx, HC, and PM according to a study conducted for the ARB (5). Two-stroke engine fuel is a gasoline-oil mixture, thus especially toxic. Particles from combustion are virtually all smaller than PM2.5. According to the Lung Association, a leaf blower causes as much smog as 17 cars.

Street dust includes lead, organic carbon, and elemental carbon according to a study conducted for the ARB. The Lung Association states "the lead levels are of concern due to [their] great acute toxicity... Elemental carbon...usually contains several adsorbed carcinogens." Another study found arsenic, cadmium, chromium, nickel, and mercury in street dust as well (6). The ARB states that a leaf blower creates 2.6 pounds of PM10 dust emissions per hour of use (7), and based on this a report from the Sacramento Metropolitan Air Quality Management District states that leaf blower dust is responsible for two percent of our PM (8). Blowers are widely used in residential areas where many people are exposed.

The EPA and ARB, in their brochure "Particulate Matter Air Pollution: A threat to our health" advise us, "Avoid using leaf blowers." The multi-agency Best Available Control Measure Working Group agrees.

In November 1997 the Los Angeles Times reported on studies by Kaiser and the California EPA showing a correlation between levels of air pollution and hospital admissions for cardiopulmonary problems (9). These reinforce conclusions reported in the August 1997 issue of Consumer Reports, which described the effect on preschool children as "especially startling." (10) Fifty thousand people in the city of Sacramento are particularly vulnerable to air pollution because of asthma or cardiopulmonary disease (11). Healthy adults and children who play or exercise vigorously are also at risk (1).

Sacramento must reduce its smog-forming emissions by 40 percent by the year 2005 in order to achieve healthier air (3), yet the Portable Power Equipment Manufacturers Association has asked its California members to lobby against stricter emission regulations developed by the ARB for 1999 (12).

- Ozone, three atoms of oxygen in one molecule, is formed by reaction of hydrocarbons (sometimes referred to as "volatile organic compounds," or VOCs) and NOx in sunlight. It is desirable in the upper atmosphere, but irritating to living tissue.
- *PM air pollution consists of particles small enough to remain suspended in the air for a significant period of time (hours to days) unless washed out by rain or otherwise removed. PM is often described by its particle size as PM 10 or PM2.5, a number that refers to maximum diameter in microns. (Thus, PM2.5 is a subcategory of, and contained within, PM10.)

References:

1. "The California Air Resources Board", a brochure currently available at the ARB offices, 2020 L Street, Sacramento CA 95814.
2. "Spare The Air: Improving Air Quality In The Sacramento Region", published summer 1997 by the Sacramento Metropolitan Air Quality Management District, which says, "During the summer, we are among the worst areas in the nation for ozone air pollution" and advises us, "Don't use gasoline-powered lawn and utility equipment..."
3. California Air Resources Board: Status Report 1995-96.
4. "Particulate Matter Air Pollution: A threat to our health", Best Available Control Measure (BACM) Working Group, January 1997.
5. American Lung Association of Sacramento - Emigrant Trails, "Fact Sheet: Leaf Blower Air Pollution Impacts Study Results."
6. County of Fresno, Inter Office Memo, October 14, 1982.
7. July 9, 1991 letter from Terry McGuire, Chief, Technical Support Division, ARB, states, "We estimate that a single leaf blower reentrains about 5 pounds of particulate matter in an hour, about half of which is PM10."
8. Reported in the Sacramento Environmental Commission's "Leaf Blower Recommendations From the Subcommittee", October 27, 1997.
9. Los Angeles Times, November 21, 1997, "Alerts Urged at Lower Smog Levels".
10. Consumer Reports, August 1997, page 36, "Air Quality Special Report: Clearing the air". In this long, forcefully written, informative article, the magazine reports that, "Outdoor air--even air that meets present pollution standards--still can be hazardous to your health." The article explains that the scientific evidence is "remarkably consistent" and significant, in spite of assertions to the contrary by polluting industries. And it says that industry typically threatens ruinous cost increases if new regulations are imposed, "but when regulations have changed anyway, the predicted economic disasters haven't materialized."
11. Sacramento Bee, 1997 (exact date unknown), "Capital-area air labeled bad but legal". The article said 152,000 people in Sacramento County suffer from chronic obstructive lung disease, asthma, or ischemic heart disease. We assume the city's per capita rate matches the county's.
12. Sacramento Bee's California Life, January 17, 1998, "Garden equipment group steps on the gas".

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Leaf Blowers and Health: Letter to the California Air Resources Board

This letter discusses some of the health effects of leaf blowers, with information sources noted for further reference (sources listed elsewhere on our web site are not necessarily repeated here). Although certain facts can be and have been documented by studies, a number of conclusions about the health effects of leaf blowers -- as they are used in actual practice today -- can be reached simply by using common sense and logic, and some of these conclusions are included in the following discussion.

General Comment on Level of Danger: In ordinary use, blowers are clearly not

being operated according to the manufacturers' own warnings. According to warnings (such as Echo's "Power Blower Operators Manual"), everyone within 50 feet of a blower in use should be wearing hearing, eye, and breathing protection. We all know from our own observations that this is not done, and it is preposterous it ever could be, as blowers are often used within less than 50 feet of bystanders such as pedestrians, cyclists, and even people inside their own homes who can hardly be expected to put on hearing, eye, and breathing protection each time they encounter a leaf blower!

Noise - Effects on the General Public: In 1980, the World Health Organization and United Nations jointly sponsored a report, "Environmental Health Criteria 12. Noise," which contained "the collective views of an international group of experts." The report listed a variety of health effects, both on workers in noisy industries and for populations in noisy living environments. Based on the evidence reviewed and the opinions of these experts, the report recommended these community noise levels:

- "For good speech intelligibility, noise levels of less than 45 dB(A)..."
- "[To avoid] sleep disturbance...a bedroom noise limit of 35 dB(A)..."
- "General daytime noise levels of less than 55 dB(A)[to prevent] significant community annoyance..."
- "To meet sleep criteria... [an outdoor level of] 45 dB(A)"

In the absence of any report to the contrary, we should not have to reinvent the wheel by proving noise is bad. The only question thus remaining is: Do leaf blowers conform to the WHO report standard? The answer is obviously no.

Whether or not any particular leaf blower conforms to its advertised noise level as determined by standards promulgated by the American National Standards Institute is not relevant. The ANSI standards are measurement methodologies, and do not even purport to be limits on noise pollution. Further, demonstrations in California communities show that the standard does not represent actual experience. For example, in Palo Alto, 1998 and 1999 leaf blower demonstrations conducted by the police department revealed that in actual use blowers exceeded their decibel ratings as supplied by the manufacturers based on ANSI standards (April 27, 1998 City Manager's Report; May 12, 1999 Palo Alto Weekly). Consumer Reports has reached the same conclusion.

Manufacturers should not be allowed to divert discussion to the noise levels produced by their quietest models, when they continue to sell louder models in greater numbers.

Noise levels are only one of the factors that determine the nuisance value of a noise source. Another factor is the frequency of exposure. Leaf Blowers are ubiquitous in California. We report some sales figures in A Brief History of the Leaf Blower on this web site. In preparation for my testimony to the Sacramento Environmental Commission in 1997, I kept a week long diary of leaf blower noise as I experienced it, mostly when I was in my home. (And, I must add, there is nothing more miserable than having one's home invaded by unwelcome noise.) I heard leaf blowers up to eight times a day, sometimes for extended periods.

The very fact that you are now engaged in preparing a report on the health effects of leaf blowers attests to their significance as a problem. The battle over leaf blowers reached the state legislature only after being fought for years in cities all over California and the nation. Judging by the number of citizen groups in the U.S. that have organized to ban leaf blowers, it seems entirely reasonable to place leaf blowers among the top ten sources of U.S. noise pollution (a list of "Known Pro-Quiet Anti-Noise Groups" recently compiled by David Staudacher, moderator of the Quiet-List, supports this assertion). There is a good reason that Echo's list of "Cities with noise activity" (my copy is dated August 8, 1997) is 21 pages long!

As Eric Zwerling, Director of the Rutgers Noise Technical Assistance Center, stated by telephone (May 6, 1999), "There is an ample body of literature on the health effects of noise." Studies documenting these effects can be found listed in the WHO report discussed above, and additional sources are listed below. Of course, all these effects, which can be predicted for bystanders to frequent leaf blower use would also occur for the operators:

- **Stress.** In 1978 the U.S. EPA, in "Noise: A Health Problem," wrote: "Noise causes stress and the body reacts with increased adrenaline, changes in the heart rate, and elevated blood pressure" and quoted Dr. Samuel Rosen of Mt. Sinai Hospital: "We now have millions with heart disease, high blood pressure, and emotional illness who need protection from the additional stress of noise." The report goes on to state: "Noise does not have to be loud to bring on these responses. Noise below the levels usually associated with hearing damage can cause regular and predictable changes in the body..." Even the unborn can be affected. The EPA report says, "[T]he fetus is not fully protected from its mother's response to stress...this indirect fetal response may threaten fetal development if it occurs early in pregnancy...A Japanese study of over 1,000 births produced evidence of a high proportion of low-weight babies in noisy areas... stress causes constriction of the uterine blood vessels which supply nutrients and oxygen to the developing baby."
- **Cardiovascular problems.** According to the Los Angeles Times (3/27/99), "German environmental authorities have documented a greater risk of heart attacks among people exposed to excessive noise...Investigation of the lifestyles of German cardiac patients has shown about a 25 percent greater chance of heart attacks among those whose work or home environments were persistently exposed to noise above 65 decibels..." The web site of the European Academy of the Urban Environment says, "The effects of noise range from disruption of physical and psychological well-being to rapid increase in cardiovascular disease." The U.S. EPA has stated, "[A] growing body of evidence strongly suggests a link between exposure to noise and the development and aggravation of a number of heart disease problems...even a small increase in the percentage of heart problems caused by noise could prove debilitating to many thousands of Americans."
- **Gastrointestinal distress.** According to the League for the Hard of Hearing, "Studies have linked noise exposure with increased gastric emptying (Kaus and Fell, 1984), with increased peristaltic esophageal contraction (Young, 1987), as well as increased anxiety. Another study found an increase in the use of

antacids and hypnotics, sedatives and antihypertensives in a noisy community...(Knipschild, 1977)."

- Depressed immunity. The U.S. EPA reports: "From a study done with animals, researchers concluded that noise may be a risk factor in lowering people's resistance to disease and infection." A recent study conducted at the University of Utrecht in the Netherlands found that "[an] uncontrollable stressor that lasts 15 minutes can have consequences for health because it may interfere with cytokine interleukin-6 function, which plays an essential role in activating the immune defense... Uncontrollable stressors also produce high levels of cortisol, which suppresses immune system functioning."
- Interrupted sleep. It does not take a study to determine that many people must sleep during the same daytime hours that leaf blowers are used in every neighborhood. One need only consider the number of hospitals, police departments, and convenience stores along with a great many other entities and services that operate around the clock. Noise can awaken us from sleep, prevent us from falling asleep, and impair sleep even when it does not awaken us.

Sleep deprivation has a number of well-known consequences including automobile and industrial accidents and diminished mental and physical health. The L.A. Times reported (March 27, 1999) that when noise disrupts sleep, it produces stress hormones that accelerate aging and heart disease.

A 1993 article in the Journal of the American Medical Association (Vol. 269, No. 12) stated, "Inadequate or poor sleep can result in fatigue and impaired alertness and cognitive ability, reducing productivity on the job and increasing the opportunity for human error and fatigue-related accidents. On-the-job accidents and lost productivity carry a staggering cost--about \$64 billion annually... Sleep loss and sleep disturbances also are thought to play a major role in causing automobile accidents. Drowsiness is blamed for some 200,000 to 400,000 automobile accidents annually. These accidents account for almost one half of all accident-related fatalities; as many as 13 percent of these deaths may be caused by falling asleep at the wheel."

- Social discord. The League for the Hard of Hearing cites studies that report increased aggression (Donnerstein and Wilson, 1976) and less helpful behavior (Mathews and Cannon, 1975) in noisy environments. Alice Suter, Ph.D., a nationally recognized noise consultant, was quoted in the Spring 1993 Issues in Science and Technology: "Even moderate noise levels can increase anxiety, decrease the incidence of helping behavior, and increase the rise of hostile behavior in experimental subjects."
- Impaired communication. Noise disrupts social interaction and can be dangerous by masking warning noises. According to the U.S. EPA, "People who live in noisy places tend to adopt a lifestyle devoid of communication and social interaction.. For millions of Americans residing in noisy urban areas, the use of outdoor areas for relaxed conversation is virtually impossible."
- Impairment of children's hearing, health, learning, and behavior. The League for

the Hard of Hearing cites studies of children and noise. The U.S. EPA reports that learning difficulties, particularly with language development and reading ability, are byproducts of noisy home and/or school environments

- Psychological, social, and emotional problems. The [UK] Electronic Telegraph (March 28, 1999) reports that "[one] American study showed that people living on noisy main roads had far fewer friends than those in quiet suburbs. People living near airports were eight times more likely to suffer mental problems." The U.S. EPA says, "Several industrial studies indicate that noise can heighten social conflicts both at work and at home... And studies of several industries show that prolonged noise exposure may lead to a larger number of psychological problems among workers."
- Particular difficulty for certain subgroups of our population, including the hearing-impaired and sufferers of hyperacusis and tinnitus.

Noise even at 65 dB interferes with the ability of the hard of hearing to recognize speech. This is an increasing problem for Americans who are losing hearing at younger ages and in greater numbers than ever before. For example, the Sacramento Bee reported (October 19, 1998) that a study of 6,928 men and women published in the American Journal of Public Health found that "the prevalence of hearing impairment nearly doubled between 1965 and 1994 in a population based in Alameda County." According to the U.S. EPA, "When exposed to a vent, loud noise, people with partial hearing loss may experience discomfort and pain." [Expanded quote below with source noted.]

Hyperacusis (also known as dysacusis, oxylacusis, hypersensitive hearing, or phonophobia) may include about one in every 100,000 people. It is a heightened sensitivity to sound which causes noise to be traumatic. As many as 40 percent of autistic children are similarly sensitive to sound. (Information obtained from the Internet.)

Noise - effects on the operators. A leaf blower that emits 75 decibels of noise measured from 50 feet, not uncommon for professional blower models on the market today will emit 99 dB at three feet (add 6 dB for each halving of the distance). A backpack model will be even closer than that to the operator's ears and heart. The documented effects of these noise levels include:

- Noise-induced hearing damage. Robert L. Blum, MD, wrote in 1998: "The National Institute of Occupational Safety and Health (NIOSH) has recognized for decades that exposure to sounds over 85 dB causes hearing loss...A search of the National Library of Medicine's database for papers after 1990 ["Medline"] yielded 927 references [including]:
- "(Wu 98) surveyed 9,535 workers who were exposed to noise > 85 dB just in the past four years (with modern hearing protection programs). 34 percent of these workers had noise-induced hearing loss. 14 percent of the total had severe hearing loss.
- "(Maisarah 93) studied 524 industrial workers and compared them with non-

noise exposed workers. Sensorineural hearing loss ,was present in 83 percent of the noise-exposed workers versus 32 percent in the control group.. -Although hearing protection devices were provided to 80.5 percent of the workers, only 5.1 percent were wearing them regularly.

- "(Neuberger 92) studied 260,917 noise-exposed workers and showed a highly significant correlation of hearing loss with intensity and duration of noise exposure."

Alice Suter, Ph.D., wrote in 1994, "[I]t is well known that some more susceptible workers will incur hearing losses at levels below 85 dB(A)."

- Vibration-induced hearing damage. Dr. Blum says: "Vibration is significant because commercial blowers are worn on the back... Vibration is transmitted up the spinal column to the skull and temporal bones, which enclose the cochlea... [E]ar muffs do nothing to protect the operators from vibration transmitted by bone conduction... Vibration-induced hearing loss is also well-documented.. - Scores of epidemiological studies have shown hearing losses in farm workers, factory workers, subway operators, and [workers in] many other industrial settings. (See Medline under key words: vibration and noise-induced hearing loss.) Vibration-induced hearing loss is over and above that produced by noise."

It is worth noting here that hearing loss is deeply damaging to a person's life in many ways. It affects employability, impairs enjoyment of music and other entertainment, creates hazards by impairing the ability to recognize sounds of danger, and perhaps worst of all, creates social isolation. In its 1978 report "Noise: A Health Problem," the U.S. EPA stated, "People with partial deafness...do not necessarily live in a quieter world. The many sounds still audible to them are distorted...When exposed to a very loud noise, people with partial hearing loss may experience discomfort and pain...There is even the further pain hard-of-hearing person faces: the emotional anguish caused, perhaps unintentionally, by friends and associates who become less willing to be partners in conversation or companions in other activities. Indeed, the inability to converse normally makes it difficult for partially deaf people to participate in lectures, meetings, parties, and other public gatherings. For a person with hearing loss, listening to TV, radio, and the telephone--important activities of our lives--is difficult, if not impossible...As hearing diminishes, a severe sense of isolation can set in."/LI>

- Stress. (See the above section on stress in "Noise - effects on the general public.")
- Heart disease. Dr. Blum cites Tarter (1990), who showed "a significant correlation between hypertension and hearing loss in workers exposed to 85 dB noise. " At the very least, the same level of cardiovascular problems experienced by people in noisy environments as discussed above would be experienced by blower operators.
- Gastrointestinal problems. The U.S. EPA says, "In studies dating back to the 1930s, researchers noted that workers chronically exposed to noise developed

marked digestive changes which were thought to lead to ulcers. Cases of ulcers in certain noisy industries have been found to be up to five times as numerous as what normally would be expected."

- Combined effects of noise and pollution on hearing. Research mentioned in the May 1998 issue of Noise & Vibration Worldwide says: "...[F]indings suggest that exposure to toluene [an ingredient in gasoline] has a toxic effect on the auditory system." Other information is available in the published proceedings of the Stockholm Fifth International Congress on Noise as a Public Health Problem in the section "Combined Agents" which includes "Interactions Between Noise and Air Pollution" and "Noise and Solvents."
- Generally poorer health. The U.S. EPA reports: "A five-year study of two manufacturing firms in the United States found that workers in noisy plant areas showed greater numbers of diagnosed medical problems, including respiratory ailments, than did workers in quieter areas of the plants." In 1994, Alice Suter wrote that "there is growing evidence that noise adversely affects general health, and the cardiovascular system in particular...which directly affects mortality" and refers to Ising and Kruppa, 1993; Peterson et al, 1978, 1981, and 1983; Rehm, 1983 ; and Zhao, et al, 1993.

Entrained dust (and other substances from the ground). Logically, we must assume that anything on the ground in small enough particles to become airborne will end up in the dust clouds created by leaf blowers and then inhaled by anyone in the area. This would include:

- Molds and pollens. These substances are known irritants to sufferers of asthma or allergies. According to the Asthma & Allergy Foundation of America, 1.8 million Californians, including half a million children, suffer from asthma and 600 of those die of it each year.
- Lead, arsenic, and mercury among other harmful substances (mentioned elsewhere on our website).
- Pesticides. Of the 18 most commonly used herbicides, seven are cancer causing, six cause birth defects, six have reproductive effects, eight are neurotoxic, nine are damaging to the kidney, and liver, and 14 are irritants according to Jay Feldman, Executive Director of the National Coalition Against the Misuse of Pesticides. In an August 27, 1998 article in the Boulder Weekly he cites the EPA and NIH as his sources for this information, and continues, "Even worse, we do not know what we should about the pesticides...EPA officials have stated clearly that numerous tests are not performed as part of pesticide registration and should be...In addition, pesticides are not currently tested in mixtures with other chemicals for their additive, cumulative, or synergistic effects...The majority of pesticide formulations...are comprised of so-called 'inert' ingredients that are often more toxic than the parent compound and not disclosed on the product label."

Increasing the hazard to lawn care operators, the use of pesticides on home lawns is four times as heavy per acre as in agriculture (The Ecology of Eden,

quoting Pollan, "Why Mow?"). And according to Olkowski, Daar, and Olkowski founders of the Bio Integral Resource Center (in their book, *Common-Sense Pest Control*), inhalation of pesticides is the most destructive form of ingestion.

- Animal feces. For an interesting discussion of this aspect of air pollution, see the L.A. Times article "Fouled Air a Major Pet Peeve for Mexico City."
- Viral disease. In 1995, local Long Island newspapers reported the death of a landscaper, Verod Hopson, from a hantavirus infection. After he died, 24 live rodents were collected from his home and workplaces, and 12 were found to have hantavirus antibodies. Humans contract hantavirus by breathing particles of infected rodent saliva, urine, or feces into their lungs. The virus is fatal about half the time, and there is no cure. Where hantavirus is present, health authorities are unanimous in advising that dust not be stirred up. Because noise can impair immunity as discussed above, it seems especially imprudent to stir up dust with a noisy instrument.

Engine emissions and other fuel-related problems. We recognize the ARB'S leadership role in the study and regulation of air pollution, and certainly don't think there is much we need to say about this aspect of leaf blower health issues. However, we do have a few comments for the sake of completeness.

Included with Echo's warning literature accompanying their gas-powered blowers is this message: "Warning! The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm."

According to the U.S. EPA (Environmental Protection Specialist Betsy McCabe, quoted in *E Magazine*, March-April 1997), small gasoline engines create up to 20 percent of the air pollution in cities, particularly NOx and particulates. Although leaf blower engine emissions will be reduced with implementation of the ARB'S Tier II emission standards, it should be noted that millions of blowers already in use do not meet these standards, and may continue in use for years.

In addition to the contribution to overall air pollution from engine emissions and fuel spillage and evaporation, it is reasonable to suggest that the hazards are substantially increased for the blower operators, who are exposed to greatly increased concentrations of these substances. And a further hazard for operators arises from gasoline spilled on their hands (or other body parts) when refueling.

Miscellaneous occasional health effects on the operators. According to the U.S. EPA, "Newspaper files and police records contain reports of incidents that point to noise as a trigger of extreme behavior...sanitation workers have been assaulted, construction foremen threatened, and motorboat operators shot at--all because of the noise they were producing." In a notorious incident, Santa Barbara anti-blower campaigner Ashleigh Brilliant once attacked a gardener and smashed his leaf blower. According to the magazine *Lawn & Landscape Maintenance* (April 1991), a Los Angeles maintenance contractor cleaning a sidewalk with a leaf blower was stabbed by a man trying to talk on a pay telephone nearby.

"Killer bees" (Africanized honey bees) are known to respond violently to loud noises, and in December 1998 Southern California newspapers reported a gardener stung over 75 times by these bees.

Effects on other living creatures. Any lover of animals can not help but be concerned about the distress and disruption caused pets and small wildlife in our neighborhoods by this unnaturally loud noise.

Economic issues.

- All the above harms have economic costs. The L.A. Times (3/27/99) reports, "Scientists from all 15 European Union countries who are drafting a common noise policy estimate that excessive racket costs governments as much as two percent of gross domestic product in lowered productivity, increased accidents and more-frequent illness." Two percent of the United States GDP is more than \$150 billion and any fraction of that is significant, to say the least.

Additionally, there are costs associated with cleaning blown dust and debris from cars, homes, and furnishings. There is also significant cost of damage to gardens and plants caused by blower-generated, hurricane-force winds. See particularly the information from Steven Dailey ([A Letter Opposing Leafblowers](#)) and Steve Zien ([Blowers Are Bad For Gardens: One Professional's Opinion](#)), both of whom are professionals in the landscaping industry. The Sacramento Bee carried a column by local garden expert Dan Pratt on June 12, 1999 entitled "Leaf blowers can neatly destroy the landscaping" that describes blower damage to plants and gardens.

- There is no evidence of increase in the cost of lawn care when blowers are banned. CQS has collected information about this issue. In our flier "Effect of Blower Bans on Gardeners' Jobs and Rates," we cite the experience of six California cities that have banned blowers with no ill effects.
- A Los Angeles contest between leaf blower and broom ([Grandmother Proves Rake and Broom as Fast as Leaf Blowers](#)) showed no significant difference in efficiency.
- Dick Roberts, organizer of Project Quiet Yards in Greenwich, Connecticut, told House & Garden in 1996, "We did a test on a half acre of grass clippings and found a rake was only ten minutes slower than a blower." That extra time would equate to less than one minute for a typical-size yard in my neighborhood.
- If there is any improved efficiency, from blower use, that efficiency is bought at the expense of everyone within hearing distance, which is extremely unfair. Noise causes a reduction in the accuracy of work, particularly complex tasks. The U.S. EPA says noise "seems to hinder work efficiency...Noise is more likely to reduce the accuracy of work rather than the total quantity. And it takes a greater toll on complex compared to simpler tasks... Other studies have confirmed additional effects of noise exposure, including exhaustion, absentmindedness, mental strain, and absenteeism--all of which affect worker efficiency."

Alternatives. There are electric blowers on the market today that are dramatically quieter than the typical gas blower, notably, the Blowhard rated at 56 dB and produced by Manutech (800-676-BLOW or <http://www.manutech.com>). Other innovations have reached prototype stage; for example, the L.A. Times reported on January 8, 1998 that a Van Nuys auto mechanic named Gody Sanchez demonstrated his own invention, a whisper-quiet leaf blower, during the hunger strike conducted by the Association of Latin American Gardeners of Los Angeles outside the L.A. mayor's office.

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History of the Leaf Blower

19th century	Japanese gardeners invent hand-held bellows to remove leaves and twigs from moss-covered soil. (1)
About 1970	Japanese engineers modernize the hand-operated blower by attaching a hose and a powerful motor. (1)
1970s	Gas blowers introduced to U.S. (2,3)
1975	Carmel bans the blower.
1976	Beverly Hills bans blowers, saying they are nuisances. (4)
1985	75,000 backpack blowers sold. (1)
1986	West Hollywood, CA bans gas blowers.
1987	•464,000 units sold. (5) • Belvedere, CA bans gas-powered blowers.
1989	•About 800,000 machines sold •millions now in use with California leading the nation. (1,5)
1990	• Indian Wells, CA bans leaf blowers. • Piedmont, CA bans gas-powered blowers. • City of Claremont stops using leaf blowers in the maintenance of city property and finds no net increase in labor hours. (6)
1991	•Ad Hoc Committee to Ban Leaf Blowers asks the Sacramento City Council to ban leaf blowers; Council passes noise and time restrictions. • Berkeley, CA City Council bans gas blowers. • Los Altos, CA bans gas blowers by popular vote. • Claremont, CA bans gas blowers.
1993	• Laguna Beach, CA bans all leaf blowers. • Mill Valley, CA bans gas blowers.
1997	•Sales now over a million annually and growing 6-8 percent per year. (4,7) •After an 11-year battle, Los Angeles bans gas-powered blowers within 500 feet of residences; ordinance remains controversial after passage

	<p>and is twice revised.</p> <ul style="list-style-type: none"> · Lawndale bans gas blowers. · Citizens' group in Santa Barbara qualifies ban for November ballot; voters approve ban 55 percent to 45 percent.
1998	<ul style="list-style-type: none"> · Citizens in Palo Alto, Portola Valley, Sacramento, and Sunnyvale work to ban blowers. · Menlo Park City Council bans blowers (8) · Los Angeles ban fully implemented February 13. · California State Senator Richard Polanco introduces <u>SB1651</u> that would prohibit California cities from banning leaf blowers. · Los Angeles Superior Court judge upholds city's ban.

Sources:

- (1) Sacramento Bee, 12/8/90
 - (2) Lawn & Landscape Maintenance, April 1991
 - (3) Horticulture, November 1992
 - (4) Newsday, 8/11/97
 - (5) Wall Street Journal, 12/4/90
 - (6) City of Claremont agenda report, 10/30/90
 - (7) Ketzler Levine, The Oregonian, ca. 1997
 - (8) Palo Alto Daily News, 3/10/98
- Various city ordinances

Grandmother Proves Rake and Broom as Fast as Leaf Blowers

(January 8, 1998 press release from Zero Air Pollution, Los Angeles)

In fighting the ban on gas powered leaf blowers gardeners have argued that it would take them twice as long to do jobs if they had to use rakes and brooms. But Diane Wolfberg, a Palisadian grandmother in her late 50s, proved them wrong in tests conducted by the Department of Water & Power Leafblower Task Force last Thursday.

In three tests involving gas powered leaf blowers and battery powered leaf blowers, Diane cleaned the areas using rakes or brooms faster than any of the battery powered blowers and almost as fast as the gas powered leaf blowers and she did a better job in cleaning up the areas.

The Task Force, formed at the direction of the Los Angeles City Council, is composed of two representatives from the gardeners' associations and one representative each from the landscape contractors association, the dealers, DWP, the Department of Parks and Recreation, General Services, the City Council, and the homeowners. It is evaluating electrical alternatives to the gas powered leaf blowers. When it was proposed that the electrical equipment be tested against gas powered leaf blowers which would be the baseline for comparison, the homeowner representative, Jack Allen, also of the Palisades, suggested that rakes and brooms be included in the comparison.

Wolfberg, who like Allen, is a member of Zero Air Pollution (ZAP), volunteered. In the first test, which required each participant to clean a pebbled cement patio area approximately 100 square feet in size with eight chairs placed on the patio, diminutive Wolfberg cleaned the area in two minutes and 30 seconds. The gas powered leaf blower operated by a large, well muscled gardener cleaned the area in two minutes but like all the leaf blowers, did not clean the area of small nuts or leaf stems, something Wolfberg was able to do.

In a second test involving the moving of paper cups and wadded paper down a 50 foot slope and back up again, she was as fast as the gas powered leaf blower and faster than the electric blowers. In the third test, requiring the cleaning of a heavy bed of pine needles and dirt down a thirty foot concrete ramp, she was the fastest and the cleanest. The leaf blowers all sent columns of damp dirt flying into the air as much as five or six feet.

Wolfberg's performance did not impress the gardeners but did impress others who had been convinced that using rakes and brooms was not feasible. The representative from DWP told Wolfberg that she had won him over.

City of Claremont Agenda Report

Prohibition of Leaf Blowers in City Owned and Maintained Property
(excerpt from report dated October 30, 1990)

Following Community Services Commission review in July of this year, staff decided to no longer use leaf blowers in the maintenance of city property. The city's leaf blower ban has added approximately one hour per day of work for each of the two tree crews. There are two people on each crew so we have added about 1/16 of a person in terms of work load. However, the grounds crews have been using a sidewalk vacuum in lieu of a leaf blower and have discovered they are actually saving an hour per day per crew. There are two crews with a total of six people so the city is saving almost 1/5 of a person in terms of workload.

Staff took a noise reading on a vacuum at 50 feet and it read 69 decibels. While this is significantly less than the 73-83 db readings on gas blowers, it is slightly more than the 65-68 db readings on electrical blowers. The vacuum noise is not nearly as annoying as the whining noise of a gas blower. The vacuum is successful in achieving a reduction in dust pollution.

Blowers Are Bad For Gardens: One Professional's Opinion

Note: The statements below are taken from Steve Zien's letter to local Assembly members opposing SB 14, the bill that would prohibit California cities from banning blowers. Zien owns and operates Living Resources Company, an organic landscape management service. In addition, he is Executive Director of Biological Urban Gardening Services (BUGS), an international membership organization of primarily professional landscapers. Zien can be reached at (916) 726-5377.

BUGS has opposed the use of leaf blowers for many years for a variety of reasons. There are many hidden costs when utilizing blowers regularly.

Wind speeds in excess of 180 mph are currently blasting landscapes throughout California. Leaves are ripped from branches, new growth and developing flowers are damaged and precious topsoil is blown away. Nurseries and Extension Agents are receiving more plant samples from gardeners indicating a tornado or hurricane devastated their landscape plants. In most instances the winds are unnatural in origin. Leaf blowers are producing wind speeds with greater force than a hurricane. They are having devastating effects.

Blower winds stress plants causing dehydration, burned leaves, and the suspension of photosynthesis and other natural plant functions. Overall growth is slowed. Natural openings in the leaves that allow for the exchange of oxygen and carbon dioxide are sealed shut. Disease spores laying dormant on the soil or fallen debris are blown back onto plants where a little moisture can renew their cycle of infestation and damage. The severity of damage corresponds to the training of leaf blower operators. Blowers effectively distribute disease spores, weed seeds and insect eggs throughout the landscape (as well as to neighboring landscapes). Blowers create a disposal problem for many landscape managers gathering up a tremendous amount of organic debris. Instead of utilizing it appropriately on site it is generally hauled away for disposal. Most landscapers currently do not have a composting program to utilize this material. Most of this organic material ends up in sanitary landfill sites which are being rapidly filled to capacity. Many communities are passing regulations limiting the disposal of landscape wastes in landfills.

A common practice by professional landscapers is to simply blow plant debris off the property and into the street. Vehicular traffic then blows this material on neighboring landscapes or back onto the freshly blown site. Material is rarely moved into a pile where it can be collected and taken to a compost pile for proper recycling.

Another hidden cost of leaf blowers is that they deprive flowers, shrubs, and trees of life-giving mulch. Without this natural blanket, erosion, water evaporation and the spread of disease all become problems. Mulch, when not blown away, creates a favorable growing environment for plants and beneficial organisms both above and below ground while adding nutrients to the plants root zone. When mulch is removed to the compost and renewed annually many soil borne diseases are kept to a minimum.

Blowers use nonrenewable fossil fuels while creating air pollution. This is a serious problem in the Sacramento area.

Perhaps the major complaint most professional landscapers receive about the use of blowers is noise pollution. This is a serious problem that has resulted in local ordinances regulating the use of power blowers. Clients, their neighbors and the operator are all impacted by the howl.

This paints a bleak picture for the power blower. It is perhaps the most over and inappropriately used landscape tool. Autumn's tremendous amounts of organic debris that requires collection might be considered appropriate use of this tool.

However, the weekly routine of blowing abuses the soil and damages landscape plants while the noise generated creates ill will from neighbors and clients alike. Leaf rakes deserve a renewed interest in the maintenance of landscapes.

The landscape maintenance industry should join BUGS and take a positive approach to blower bans. Old fashioned leaf raking can be a renewed service that their business could provide. It could be used as a selling point--no noise and environmentally sound too! Approach it right and they could charge the client an appropriate fee for this service, especially if blowers are banned. This could even become a major selling point for some companies. It could lead to business growth and the hiring of more personnel to meet the demand. Environmentally sound landscapers should be able to turn this kind of legislation into a positive for their businesses, making it work to their benefit.

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